

WatchTime

THE MAGAZINE OF FINE WATCHES

E-SPECIAL

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INSIDE ROLEX

- THE NEW
FACTORY
IN BIENNE
- THE MAKING
OF THE 4130
- WHAT GOES ON
IN GENEVA
- A ROLEX
LEXICON



4 ARTICLES FROM THE PAGES OF WATCHTIME

CONTENTS

“Inside Rolex” Special Tablet Edition, February 2013



This special tablet edition of WatchTime presents a rare look inside the manufacturing complexes of Rolex, the world's largest luxury watch brand. It consists of articles that have appeared in WatchTime magazine. Two articles by WatchTime executive editor Norma Buchanan recount her visits to Rolex's facilities in Geneva and Bienne. A follow-up article by technical editor Mike Disher describes Rolex's subsequent expansion of the Bienne facility. A fourth article, also by Disher, provides definitions of the technical terms Rolex uses to describe its watches. All of the articles are reproduced as they originally appeared in WatchTime.



4 **INSIDE ROLEX BIENNE**
BY NORMA BUCHANAN

On a rare tour of Rolex's movement-manufacturing complex, WatchTime witnesses the making of the Cosmograph Daytona Caliber 4130. (From the June 2010 issue of WatchTime)

18 **BIGGER STILL**
BY MIKE DISHER

Rolex's movement operations in Bienne used to be huge. Now they're humongous. (From the February 2013 issue of WatchTime)

30 **INSIDE ROLEX**
BY NORMA BUCHANAN

The very private Swiss watch giant opens the doors of its new Geneva facility. (From the August 2006 issue of WatchTime)

40 **A ROLEX LEXICON**
BY MIKE DISHER

The world's biggest watch brand speaks a language all its own. If you've ever scratched your head over terms like "Paraflex," "Tridor," or "Cerachrom," this lexicon will help. (From the October 2012 issue of WatchTime)

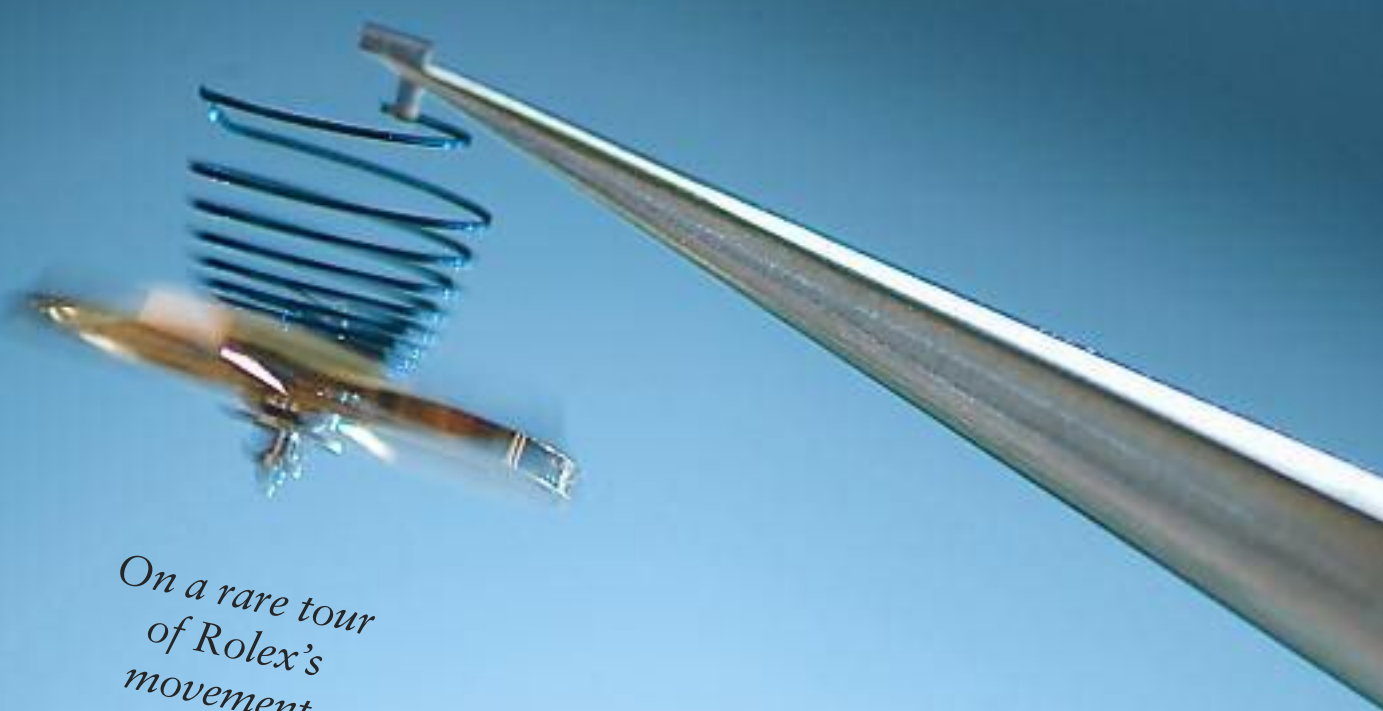


ON THE COVER: Rolex Cosmograph Daytona in white gold. Photo © Rolex/Claude Bossel

WatchTime

THE MAGAZINE OF FINE WATCHES

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Executive Editor	Norma Buchanan
Managing Editor	Dara Hinshaw
Technical Editor	Mike Disher
Associate Editor	Jay Deshpande
Digital Media Editor	Mark Bernardo
Digital Media Assistant	Jason Francisco
Art Direction/Design	Publishers Factory, Munich
Contributing Writers	Gwendolyn Benda Gisbert L. Brunner Rüdiger Bucher Maria-Bettina Eich Jens Koch Alexander Krupp Alexander Linz Martina Richter Gerhard Seelen Thomas Wanka Iris Wimmer-Olbort
Translations	Howard Fine Joanne Weinzierl
Photographers	Nina Bauer Marcus Krüger Nicolas Lieber OK-Photography Eveline Perroud Maik Richter Nik Schölzel Zuckerfabrik Fotodesign
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*On a rare tour
of Rolex's
movement-
manufacturing
complex,
WatchTime
witnesses the
making of the
Cosmograph
Daytona
Caliber 4130.*

BY NORMA BUCHANAN

A close-up, angled photograph of a Rolex crown logo on a watch case. The crown is a five-pointed star shape, rendered in a light blue or silver tone. It is set against a dark, textured background, likely the metal of the watch case. The lighting creates highlights on the edges of the crown, emphasizing its three-dimensional form. The overall composition is abstract and focuses on the iconic branding element.

Inside Rolex Biennale

The first thing that strikes you is its sheer size. The Rolex movement-making complex, on the outskirts of Bienne, Switzerland, is a study in gigantism. It consists of four monolithic buildings, occupying 170,000 cubic meters of space. It's imposing, and, with its air of impenetrability, a little mysterious.

We ride out there one February afternoon because Rolex has agreed to give us, two *WatchTime* editors, a tour of the facility, a mainplate-to-hairspring view of how it makes its movements, 750,000-plus of them per year.

Before the tour, we receive a background briefing, a combination of live presentation and film. It takes place in a proportionately large auditorium attached to what is surely the biggest watch-company reception area we've ever been in: a two-story-high, light-filled atrium with a Rolex-green marble floor.

This complex, Manufacture des Montres Rolex SA, located in an industrial zone called Champs-de-Boujean, is the sister of Rolex SA in Geneva, which makes cases, bracelets and dials; assembles the watches; and does the company's gem-setting. Rolex corporate headquarters are also in Geneva. (See "Inside Rolex" in *WatchTime's* July-August 2006 issue.)

Here in Bienne, about 2,000 employees make movement components, 50 million of them per year, assemble the movements, and send them to Switzerland's chronometer-testing agency, COSC (Contrôle Officiel Suisse des Chronomètres) to receive chronometer certification. (All Rolex-made movements receive certification except for most in the Cellini collection — although Cellini Prince models are COSC-certified.) Rolex Bienne then ships the movements to Rolex Geneva for casing. The four Bienne buildings, set against the backdrop of the Jura mountains, are called Rolex III, IV, V and VI. (Rolex I and II are old, former factory buildings near the center of Bienne. Rolex no longer owns them.) The company also has a factory in the town of Le Locle, em-

IN BIENNE,
ROLEX MAKES
COMPONENTS
AND ASSEMBLES
THEM INTO
MOVEMENTS
THAT ARE
SHIPPED TO
ROLEX GENEVA
FOR CASING.

*The Cosmograph
Daytona Caliber 4130,
introduced in 2000*





*Components are
made by machine and
assembled by hand.*

ploying 150 people, where some movement assembly takes place.

Until 2004, Rolex Bienne and Rolex Geneva had different owners. The former belonged to the descendants of Jean Aegler, whose Aegler SA factory in Bienne provided movements to Rolex founder Hans Wilsdorf starting in 1905. (For more on the history of Rolex Bienne, see “The Bienne Connection” sidebar). Rolex Geneva was, and still is, owned by the Hans Wilsdorf Foundation, which Wilsdorf established in 1945.

Six years ago, Rolex Geneva bought the Bienne facility and the two were merged. That move, along with Rolex’s long-term project of acquiring many of its suppliers of components and equipment, has transformed the company into a vertically integrated *manufacture*.

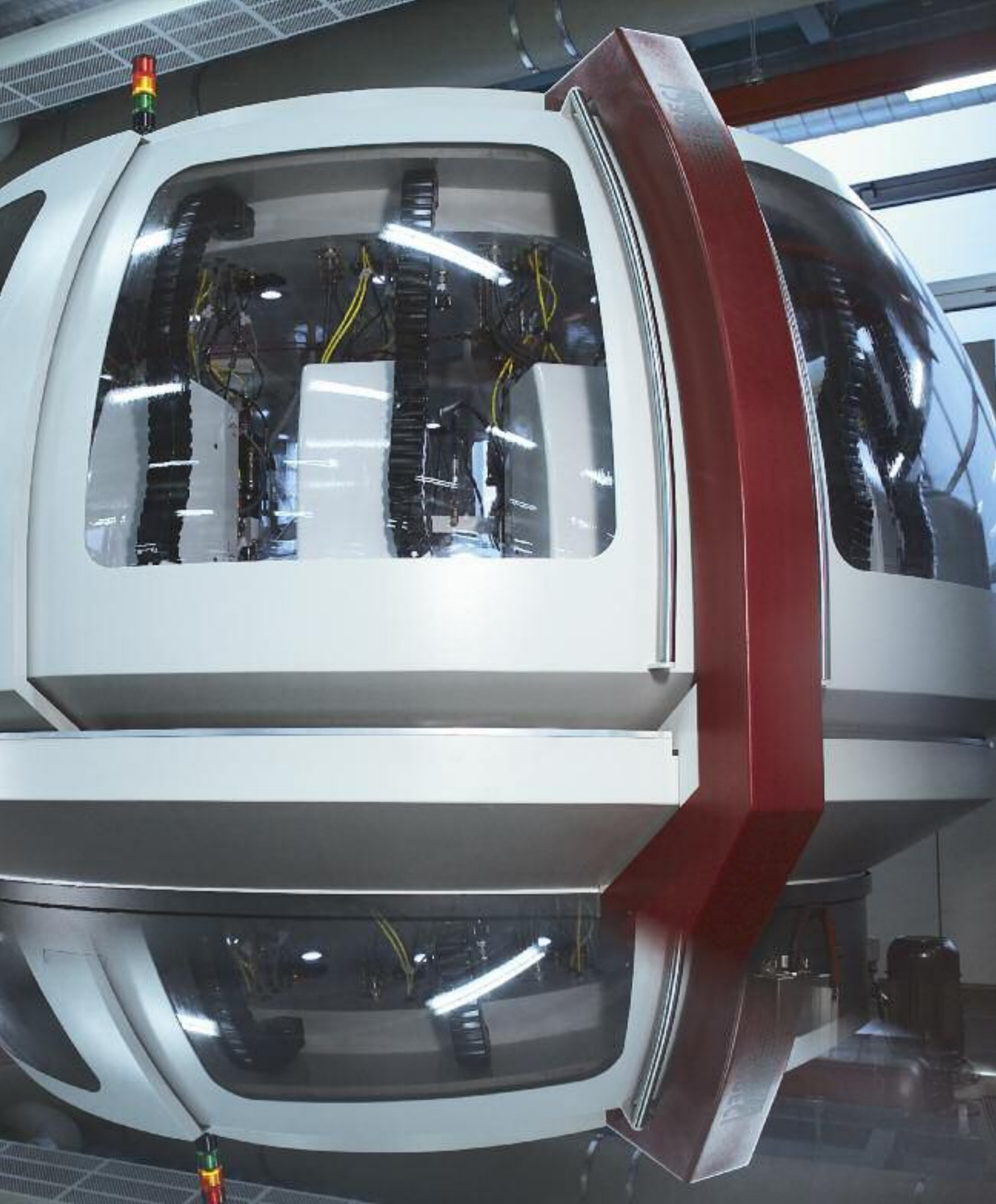
CLASS OVER, we set out on the tour. It will have a theme, says François Paschoud, one of the facility’s technical directors: We will be following the manufacturing steps of Rolex’s famous Caliber 4130, the chronograph movement that Rolex launched in 2000 to replace the Zenith El Primero caliber it had been using in its Cosmograph Daytona models. That introduction was a major event for Rolex; it meant that from that point on all movements used in the Rolex brand were made in-house (watches in Rolex’s sister brand, Tudor, have ETA movements).

Besides Paschoud, our guides on the tour are the facility’s top manager, Raymond Kerrison, and Jacques Baur, head of research at Rolex.

We start in Rolex V, in the department where the movement’s plates and bridges are made. There, in a huge room filled with the roar of toiling machines, we see something — or rather some things — we’ve never seen before. They look like giant, round, glass pods, or maybe spaceships, nearly as high as the ceiling and 12 feet or so in diameter. The Rolex officials call them “modules.” There are a dozen of them, some connected at the top to an adjacent module by metal rails, which, we soon learn, are a kind of monorail transit system for carrying components from one module to the next. Four of the modules are dedicated to the 4130. Inside



Plates and bridges are manufactured by CNC machines inside huge, pod-like modules.



each one, a cluster of CNC machines are stamping, drilling, milling, turning and polishing the plates, the rough forms of which were produced, by the stamping process, in another department. We can see almost none of the actual work from outside the modules; the machines have their backs turned to us, as it were, and are facing inside. What we do see is oil, gallons and gallons of it, which is squirted on the plates and bridges to lubricate them during manufacturing and to rinse off metal shavings.

To see the actual processes, such as milling and stamping holes in the plates, we watch a movie on a video monitor. There are more than 50 tools working simultaneously in the four modules. Humans are far scarcer in this room: just one or two are needed to keep the noisy machines humming.

The modules are made exclusively for Rolex by a Rolex-owned company. They serve several purposes. Most obviously, they contain the oil that would otherwise be knee-deep on the factory floor. They also protect the components and machinery from dust. Thirdly, they keep the components at the same precise temperature throughout the manufacturing process so they will neither shrink nor expand. Any such change, however small, would have disastrous consequences given the tolerances involved: two microns,

IN 2004, ROLEX
BIENNE MERGED
WITH ROLEX
GENEVA TO FORM
A VERTICALLY
INTEGRATED
MANUFACTURE.

that is, two thousandths of a millimeter, or, as Paschoud says, a few hundredths of the diameter of a human hair.

When one module completes its work, the plate or bridge moves to the next module by means of the monorail. Each component is mounted on its own small pallet. Human hands never touch the component during this phase of production. The entire process consists of about 100 different steps. (Some are performed next door, in Rolex III.) There are some 350 points of measurement for each plate.

Leaving the department, we pass the quality control section where, helped by precision measuring equipment and magnifying lenses, employees in two separate departments check the plates and bridges to be sure they have exactly the right measurements and are free of any surface flaws. They work behind a glass partition in a controlled environment. That, Paschoud tells us, is because a temperature change of as little as 1 degree can affect a component's measurements.

If the plates and bridges pass muster, they are sent to another department for rhodium galvanic coating and decoration: circular graining, for instance.

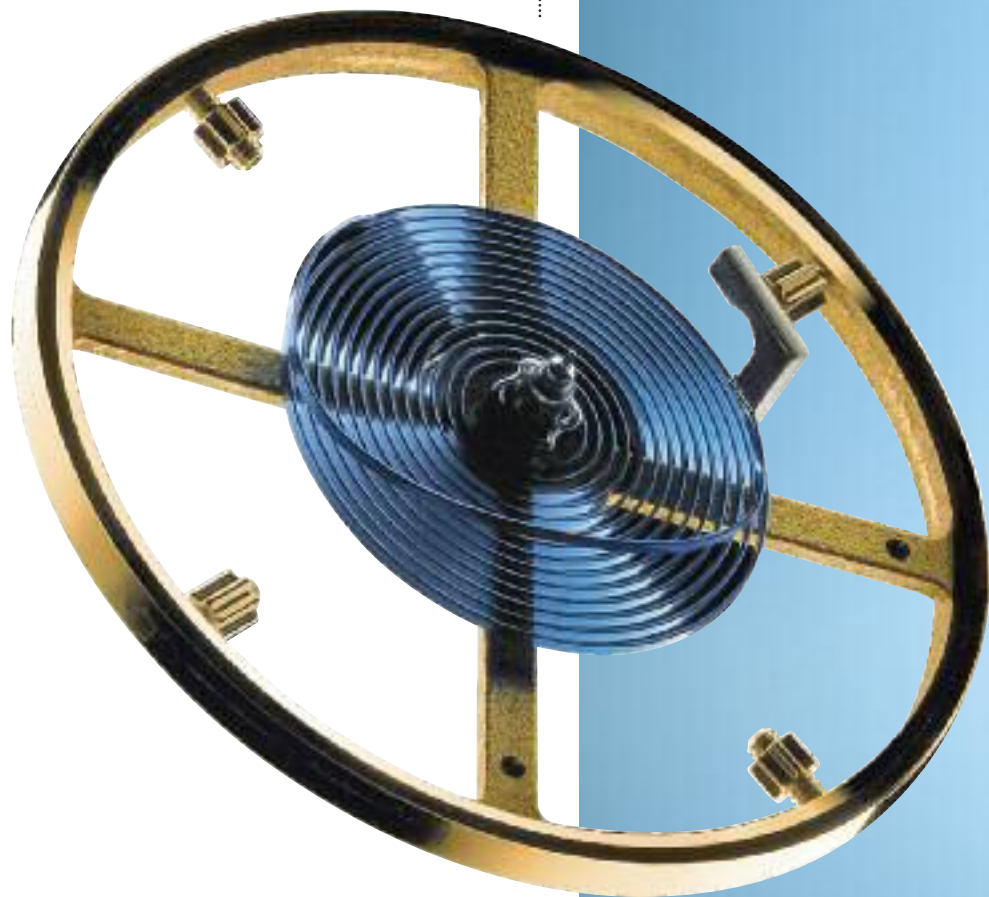
WE THEN WALK through an underground passageway connecting Rolex V to Rolex IV, where small components such as staffs, wheels (including balance

Rolex V is one of the four big buildings in the Bienne complex.



ROLEX INTRODUCED THE PARACHROM HAIRSPRING WHEN IT LAUNCHED THE 4130 MOVEMENT A DECADE AGO.

Rolex balances have gold Microstella screws and Parachrom hairsprings.



wheels), and Microstella screws, which are used to adjust the balance, are made. On the way, we pass a man riding a bicycle (another watch-factory first for us). There are more bikes, special Rolex bikes, with light-colored tires, parked at the elevator in Rolex IV. Employees use them to move quickly between the buildings.

This department's job is to turn bars and tubes of metal, some two meters long, into pieces as small as one millimeter across. Tolerances here are as tiny as two microns. The parts are made by turning, cutting, stamping and spark erosion performed by CNC machines. As in the plates-and-bridges department, much of the work is hidden within the machines. The metal, an alloy of steel, aluminum or copper, goes in one end and, seemingly by magic, comes out the other in the form of infinitesimally small screws (the Microstella screws are made of gold) or tiny wheels. Decoration also takes place here: wheels, for instance, receive a sunray finish.

Our guides show us one machine that is making a pivot for a winding rotor, a component that is still in the testing stage and is hence being produced in a small series. Paschoud pulls out a mechanical drawing of the pivot, which is just 2.5 mm long and 2.2 mm wide, with a diameter of 0.3 mm at its end. It's a simple thing, but the drawing is so complicated, and dotted with so many measurements, you'd think it depicted a nuclear submarine.

ALL THESE COMPONENTS come together in Rolex VI, our next stop, which we reach through another underground passageway. Before we go in, we don disposable white lab coats and blue plastic shoe coverings so we won't track dirt inside. The latter are dispensed by a machine (by now we expect no less): we stick our feet, one at a time, smartly into the machine and the booties' elastic-band tops snap shut around our ankles.

But before we get to the movement-assembly department, we're in for a treat, a glimpse at something even inveterate watch-factory tourists seldom see. We're going to watch hairsprings being made. And not just any hairsprings, but blue



The Parachrom is made in a giant furnace (above, left) with a porthole (left) for viewing the alloying process (above).

Parachrom ones, which are unique to Rolex.

The company introduced Parachrom hairsprings in the 4130 when the movement was first launched a decade ago. Since then, they have worked their way into all Rolex-brand men's watches (the women's models, along with the company's Cellini collection, have hairsprings made of an alloy identical to that used by Nivarox). The advantages of Parachrom, says Jacques Baur, is that it has superior shock-resistance and anti-magnetism. There are two models of Parachrom hairsprings. One is made for the 4130 and 4160 (a relative of the 4130 used in the Yacht-Master II). The other is for the 3100-series non-chronograph men's watch calibers, used in the GMT-Master II, Submariner, Deepsea, Day-Date, Datejust, Explorer, and Milgauss.

Parachrom is an alloy of 85 percent niobium and 15 percent zirconium. Rolex makes it itself, by taking 30-centimeter rods of each element, two of niobium and one of zirconium, clumping them together and melting them so that they become a homogenous alloy.

The melting takes place inside an electron-beam vacuum furnace, a tall, shiny behemoth that reaches up through the ceiling and looks kind of like a rocketship, albeit a rather chubby one. Like the modules in Building V, it's a Rolex exclusive. And, like them, it makes us gape because it's so big and odd-looking. We're invited to peek into the furnace. The Rolex executives warn us that the light inside it can damage our eyes if they're unprotected, and hand us dark goggles. We climb up on a viewing platform, put on the goggles, and peer into the furnace through a porthole. There we see the soon-to-be Parachrom rod being heated by a burning stream of electrons to a temperature of 2,400 degrees Centigrade. The rod glows with fiery intensity. It is heated one section at a time: the rod will pass through the electron fire three times before the metal is completely blended. The process is entirely automatic, but a technician observes it on a video monitor to make sure nothing goes awry.

Parachrom blended, it's time to turn it into hairsprings. That requires a marathon series of stretching and flattening opera-

tions, punctuated by occasional heat treatments to soften the metal so that it can be worked. When they're over, the original 30-centimeter-long rod, which is one centimeter in diameter, will be three kilometers long and about 0.1 millimeter thick (the exact thickness will vary according to the type of hairspring being made). A single rod yields 10,000 hairsprings.

The first stretching process is cold rolling. It's performed by two men in lab coats who stand on either side of the rolling machine, passing the ever-thinner rod back and forth through ever-smaller notches in the machine. They seem like an anachronism in this world of advanced technology. The reason flesh-and-blood workers perform this task, Baur explains, is that the metal is quite brittle when it first comes out of the furnace and must be handled very carefully until it develops some elasticity. When the men are finished, the bar is three meters long.

Machines take over again for the next process: wire drawing. We stop to watch one machine pulling the wire through four successive dies as it becomes ever thinner. It will pass through about 50 dies in all.

Then the wire, which is still round, like a pencil, is flattened by a technique called high-precision cold rolling. It takes place in its own, temperature-controlled room. We can't go inside, Baur tells us: the change in room temperature caused

by our presence would ruin the wire. The thickness tolerances the machines must meet are 0.1 microns. We peer through the glass at the machine and can barely see the wire: at the end of the process, it is 50 microns thick and 150 microns wide.

Now the straight wire is turned into a coiled spring, manually, through a delicate and painstaking process called, in French, *estrapadage*. A woman takes three 20-centimeter segments of wire and, with a dexterity that amazes us, threads one end of each segment through a thinner-than-a-hair notch in the middle of a lifesaver-shaped mold, affixing the strands at the center so they will stay in place. She then rotates the mold, as if it were a potter's wheel, causing the three wires to wrap around the spindle within the mold. The reason three wires are coiled in one mold, Baur explains, is to provide the correct spacing and hence the correct curvature for each coil. The mold is heated so the wire will retain its new shape. Then, using a tweezers, the technician separates the three springs, which are about 6 millimeters in diameter. Difficult as the coiling process is, Baur tells us, separating the springs is much harder: one tiny slip of the tweezers and the springs are rendered useless.

What about the springs' blue color, we ask. They're a nice shade of cobalt or

CONTINUED ON PAGE 118

Workers assembling movements with the Jura forest in the background



The Bienne Connection

Perched on a slope overlooking Bienne's Old Town is a building with, at its top, big green letters spelling "Rolex," flanked by two yellow crowns. The building is a Bienne landmark, an important part of the city's history. But what happened inside affected not just Bienne but the whole watch world.

This was once the factory of the movement maker Aegler SA. Aegler was founded in 1878 by Jean and Anna Maria Aegler, just as Bienne was hitting its stride as a major watchmaking center. The company specialized in small, precision watch movements. After Jean Aegler died, in 1891, his son Hermann took the business over, continuing to make the same type of movements. (The building with the Rolex sign was built by Hermann Aegler in 1914; the original, smaller factory that Jean Aegler built is right in front of it.)

Small, high-precision movements were just what Hans Wilsdorf, an ambitious, young German-born watch-industry entrepreneur, needed. As the 20th century dawned, Wilsdorf had become convinced that, despite the nay saying of nearly everyone in the watch business, the wristwatch would one day prevail over the pocketwatch.

In 1905, Wilsdorf's company, Wilsdorf & Davis, based in London, placed a huge order with Aegler for movements to use in wristwatches. Three years later, Wilsdorf gave a brand name to his line of wristwatches: Rolex. It was destined to become the world's biggest, most famous, luxury watch brand. (Wilsdorf & Davis changed its name to Rolex Watch Co. in 1915.)

Through the decades that followed, Aegler's firm in Bienne continued to make movements for Wilsdorf's company. It developed several important innovations, the most famous of which is the self-winding system, based on the 18th-century notion of a spinning rotor. Wilsdorf named this system the "Perpetual." Its inventor was Aegler SA's technical director and chief, Emile Borer, who patented the device in 1931. (Borer married into the Aegler family.)

In the meantime, Wilsdorf had, in 1919, moved from London to Geneva, where his company made cases for Aegler SA's movements, assembled the watches, and sold them all over the world. In his memoirs, he explained that "we want to leave to our factory in Bienne exclusively the production of watch movements, while we ourselves create in Geneva case models adapted to the refined taste of the Genevans." (Wilsdorf's calling the Aegler factory "our factory" refers to the fact that, for part of Rolex history, Rolex had partial ownership of the Aegler factory.)

The Rolex Geneva-Bienne division of labor established more than a century ago continues to this day. Bienne makes the movements; Geneva makes just about everything else, then assembles the watches and markets them.

What has ended, though, is the two companies' separate ownership. In 2004, Rolex Geneva, now called Rolex SA, acquired Rolex Bienne (Manufacture des Montres Rolex SA), which had belonged to descendants of the Aegler-Borer family.



Rolex founder Hans Wilsdorf

The Aegler-Rolax factory in Bienne circa 1955



CONTINUED FROM PAGE 115

royal blue, very close to the color of blued steel screws or watch hands.

The color is produced by an oxidation process, we're told. It not only spruces up the springs' appearance, it makes them more stable — that is, better able to perform consistently over a long period of time. We are not allowed to see the bluing operation: it's a Rolex secret.

We do get a look at one of the last hairspring-making steps: the bending of the outer end of the spring into a Breguet overcoil. It is done automatically by a machine, another Rolex exclusive, which is fitted with two flat hammers that strike the spring at precise points to bend it at the correct angles. But because the Parachrom has tiny inconsistencies from spring to spring, and thus responds slightly differently to the hammer strikes, an employee looks through a microscope to check the precise curvature of each spring. If needed, she makes adjustments using the hammer machine.

NOW IT'S TIME to see all the parts unite to form Caliber 4130. We go to the movement assembly department. There, workers specialize in specific assembly tasks.

One person puts the gear train together. Another mounts the balance and, using an electric screwdriver programmed to provide just the right amount of torque, screws down the balance bridge. We see the 4130 come to life: its blue hairspring starts to expand and shrink as if it's breathing.

To protect the movements from dust while they're being assembled, they're placed on a horizontal, rotating carousel underneath the watchmaker's bench. Each movement — there are 10 on each carousel — pops up through a hole in the bench when its turn comes to be worked on. It then drops down again and the next movement presents itself. The technicians' hands move as deftly as if they were those of robots performing microsurgery.

Then a machine lubricates the movements. We watch a video screen as the machine places tiny droplets of oil on each tooth of an escape wheel. All told, there are 200 different points in the movement that need lubrication. The company uses five types of lubricant in each caliber. There's one lubricant for the winding barrel, for instance, another for the chronograph mechanism. Some of the

A rendering of the as-yet-unbuilt Rolex VII building (in foreground), planned for completion in 2012





*The final product:
the Cosmograph
Daytona*

THE LAST STEP
WE SEE IS THE
ASSEMBLY OF
CHRONOGRAPH
COMPONENTS
ON THE BASE
MOVEMENT,
MAKING THE
4130 COMPLETE.

oils are manufactured in-house; others by outside suppliers using recipes exclusive to Rolex. Important as lubricants are (Baur says the stress endured by some components is equal, relative to size, to the stress a train imposes on a train track), they're applied in almost trace amounts. Each year, the company uses just 10 liters of oil for all the movements it makes and services.

The next stop on the tour is the fine adjustment department. There, an employee corrects the movement's rate so that it will meet COSC standards. Using a tiny wrench, she turns the gold screws; Rolex has named them Microstella screws because of their star-like shapes. There are four of them, in two sizes, all four affixed to the inner edge of the balance wheel.

When she finishes, the movement is running as precisely as anyone could want. But it's missing something: it's not yet a chronograph. That's soon remedied: a watchmaker assembles the chronograph components onto the base movement. She uses a needle-thin applicator to place lubricant in eight different places in the chronograph mechanism. She screws the bridge into place. Then she checks her work, starting and stopping the chronograph to make sure the column wheel, clutch, hammers, cams and all else work correctly. Bingo.

The movement will now be sent to COSC, either to the agency's Bienne office or to its Geneva facility. In 2008, COSC certified 769,850 Rolex movements. (COSC data for 2009 will be released in August.)

Just one stop remains. Standing in the top-floor restaurant in Rolex VI, we look out through the picture window at an enormous construction project. That, we're told, is Rolex VII. When it's finished, in 2012, it will provide an additional 230,000 cubic meters of space. It will house, among other things, a robotized components storage and delivery system that will transport parts to distant work stations in a matter of minutes. The new extension will be connected to Rolex IV and VI, creating one mega production unit.

Soon giant Rolex will be bigger still.○

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Bigger Still

BY MIKE DISHER

*Rolex's movement-making operations
in Bienne used to be huge.
Now they're humongous.*



T


hree years ago, WatchTime toured Rolex's movement manufacturing facility in Bienne. Our story detailing the visit ended with the observation: "Standing in the top-floor restaurant ... we look out through the picture window at an enormous construction project. That, we're told, is Rolex VII. When it's finished, in 2012, it will provide an additional 230,000 cubic meters of space Soon giant Rolex will be bigger still."

Fast forward to 2012. In October, WatchTime returned to Bienne for the official opening of that new building, the first Rolex movement manufacturing facility constructed since 1994. It is part of a huge Rolex complex on the outskirts of the city in an industrial area called Champs-de-Boujean. When Rolex is finished transferring machinery and equipment from elsewhere in the complex into the new building, later this year, all of Rolex's movement-making operations will be under one enormous roof. (Rolex does not divulge its production figures, but in 2011, it made 751,285 mechanical movements. This is the number of COSC certificates it earned that year – the latest year for which COSC data is available. Rolex has all its mechanical movements certified by COSC.)

Rolex acquired the land for the new building from the city, as well as an adjoining parcel for future expansion, in 2006. Construction on the new site began in the summer of 2009 and was completed this past summer.

*THE NEW FACILITY IS PART
OF ROLEX'S ENORMOUS
MANUFACTURING COMPLEX ON
THE OUTSKIRTS OF BIENNE.*





*The building
provides an
additional 230,000
cubic meters
of space.*



Left to right: Bertrand Gros, Marco Avenati and Johann Schneider-Ammann cutting the ceremonial ribbon

The new facility's opening ceremony was typically low key, though for famously discreet Rolex, simply inviting guests and media inside represented a break from the past. There was no band, no flyover, and no fireworks. Instead, two leading Rolex executives – chairman of Manufacture des Montres Rolex SA Bertrand Gros and director Marco

Avenati, and Swiss federal councilor and economics minister Johann Schneider-Ammann, cut a Rolex-green ribbon outside the new building. Then, inside, there were short speeches and a tour.

The new building's interior combines clean, modern design and state-of-the-art manufacturing. The centerpiece is a fully automated component stocking and re-

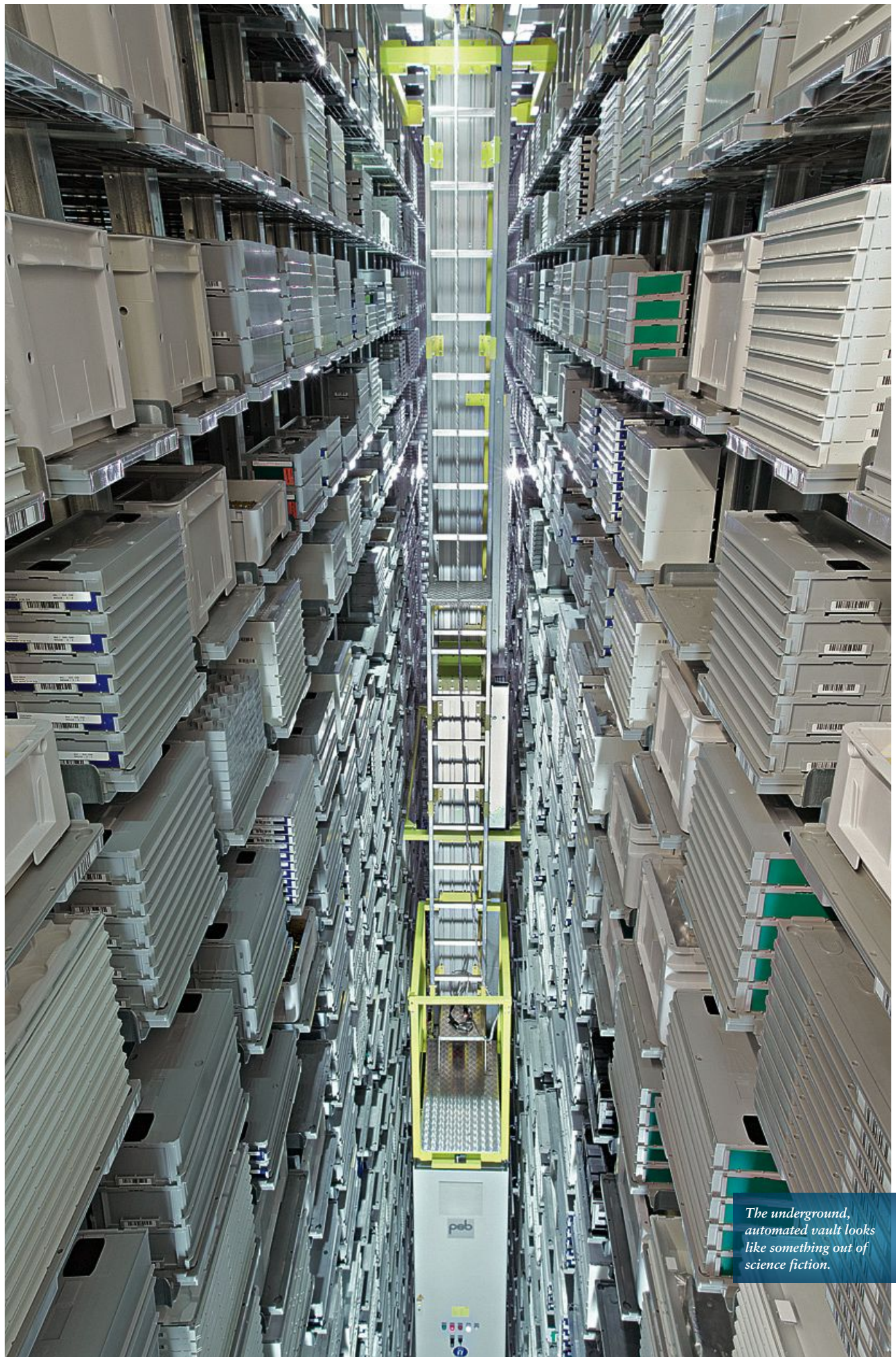
trieval system that uses robots and conveyor belts to collect needed parts and transport them to production workshops throughout the building.

The system is activated when an employee enters an order for parts into the computer. The request is sent to a secure, underground, 10,000-square-foot vault. The vault has 14 aisles of shelves and more than 46,000 storage compartments capable of holding tens of millions of components. Each aisle is served by robots that pick up the requested trays and place them on distribution conveyors that go to the various working areas. The vast conveyor network, almost three-quarters of a mile in length, includes four vertical distribution towers with elevators to shuttle orders between floors. A routing system coordinates 60 programmable controllers which guide the trays between the stock area and the workshops. With trays traveling at about three meters per second, orders reach their final destination in only a few minutes. Workers pick up and drop off trays at 22 distribution stations spread out on all floors. The system even protects components from dust and light.

(Continued on page 75)



Rolex chairman Bertrand Gros at the opening ceremony



The underground, automated vault looks like something out of science fiction.

Movement component orders are prepared for delivery to workshops via the automated distribution system.









*A watchmaker
assembles a caliber
4130 for a
Cosmograph
Daytona.*

*THE COMPLEX
WILL HOUSE
ALL ASPECTS
OF MECHANICAL-
MOVEMENT
MANUFACTURING.*

(Continued from page 70)

To move larger objects, the new building houses a freight elevator large enough to accommodate 240 people and powerful enough to lift nearly 20 tons.

The new building consists of four stories above ground and three below. The exterior is dominated by large glass panes that allow natural light to illuminate the work of the watchmakers and technicians inside. The windows also offer employees sweeping views of the Jura to the north and west and the Alps to the southeast. Internal and external courtyards provide additional natural light, as do a series of visually striking light wells, each of which measures 23 feet in diameter. The light-well layout mimics the wheels in a gear train, and the wells bring daylight to centrally located employee relaxation areas on each floor. Employees also enjoy a cof-

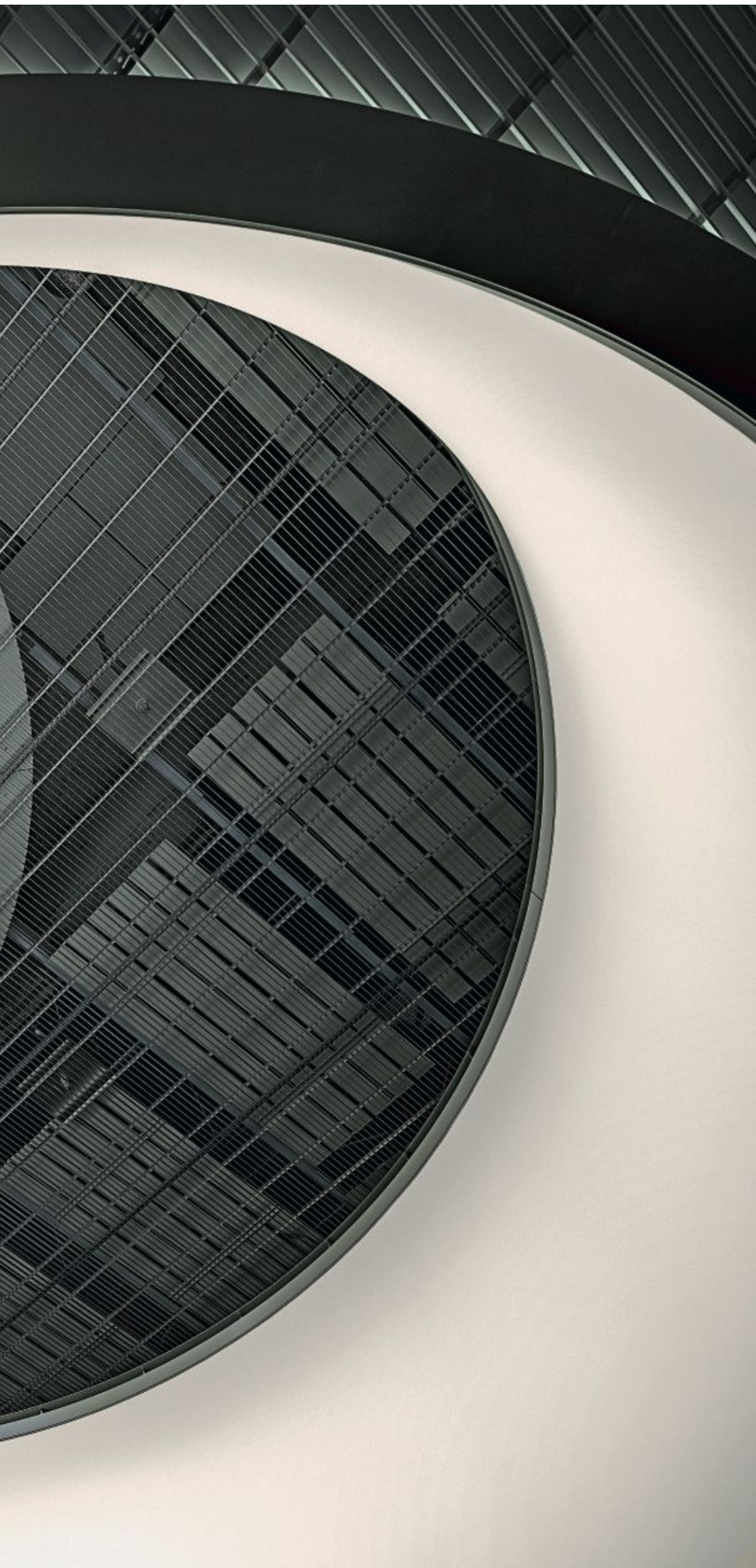
fee bar and a 450-seat restaurant that opens onto a rooftop terrace.

Two adjacent buildings are being refitted to house management and administrative functions and technical activities such as the design and manufacture of tools. Together, the three buildings will offer almost 1 million square feet of space, enough to hold more than 17 football fields. The complex will house all aspects of mechanical-movement manufacturing, including machining, stamping, thermal and surface treatments, maintenance, and laboratory activities.

To protect the planet and pamper employees, the new building complies with Swiss Minergie standards. These criteria cover a range of issues relating to the environment both inside and outside the building, including thermal insulation, draft-free ventilation, internal air filter-

ON THE SCENE
Rolex's new factory

*Each of the building's
light wells is 23 feet wide.*



ing, and use of renewable energy sources. To meet these standards, the new building incorporates groundwater-based heating and cooling, roof-mounted solar panels, high-performance heat pumps, and a partially planted “green” roof, among other features.

The new facility completes Rolex’s vertical integration into four sites – three in Geneva and one in Bienne:

- Geneva, Acacias: This is Rolex’s world headquarters. The facility houses management, research and development, design, communication, sales, and after-sales service. Final assembly of watches from components delivered from other sites also occurs here, as does final quality assurance.

- Geneva, Plan-les-Ouates: This facility houses the development and manufacture of cases and bracelets, along with Rolex’s gold foundry and quality assurance for materials.

- Geneva, Chêne-Bourg: This site houses the development and manufacturing of dials, along with jewelry and gem-setting operations.

- Bienne: This location includes mechanical-movement manufacturing, assembly, and quality assurance.

Together, these facilities employ more than 6,000 people (including more than 2,000 in Bienne), and they allow Rolex to manufacture in house all of the major components in its watches.

With its decade-long vertical integration program now complete, Rolex is indeed bigger still. ○

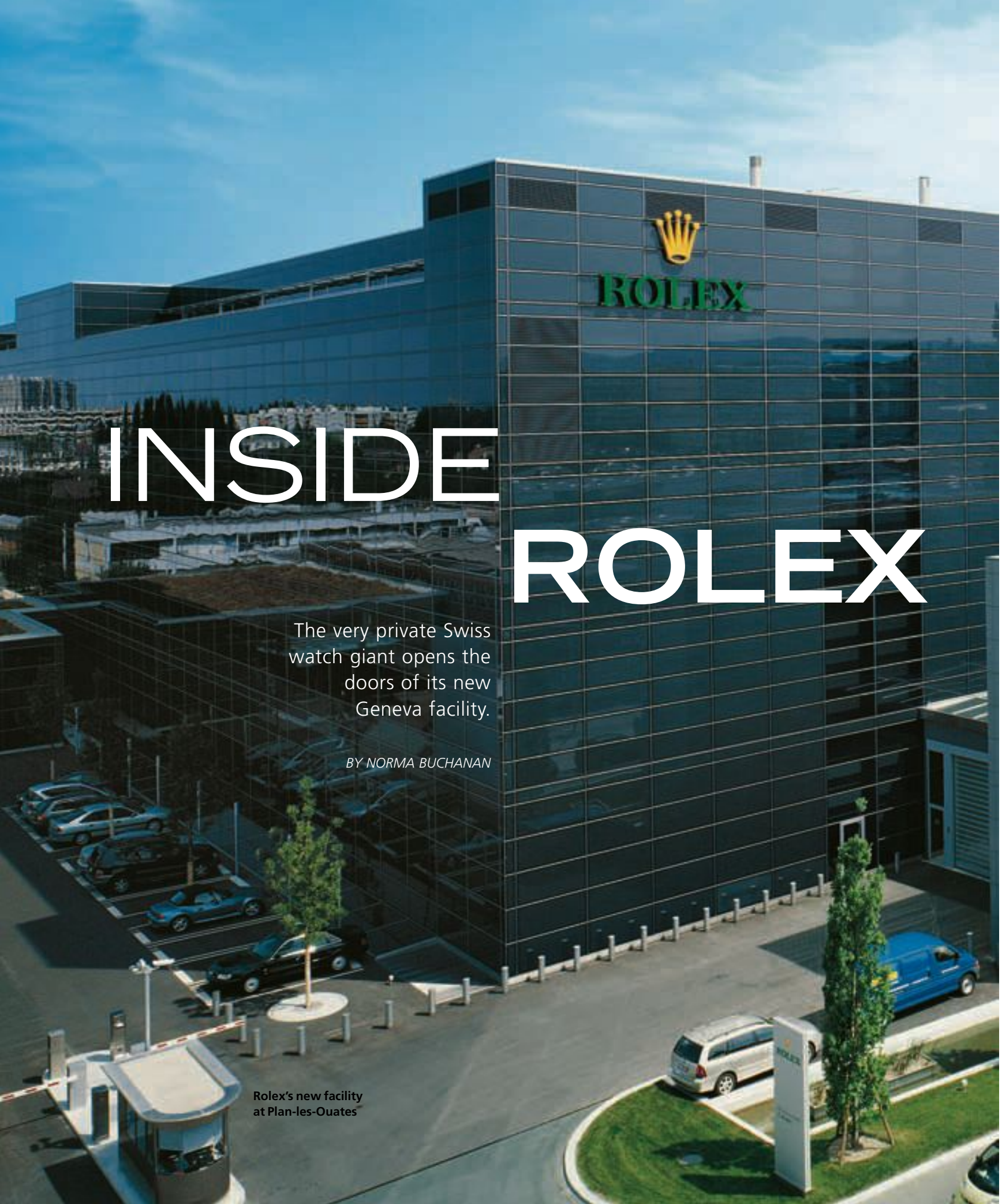


Scan here to see more photos of Rolex’s facility in Bienne.
<http://www.watchtime.com/?p=24519>



Scan here for a 2010 Watchtime story on the Rolex movement manufacturing facility in Bienne.
<http://www.watchtime.com/?p=24694>





INSIDE ROLEX

The very private Swiss
watch giant opens the
doors of its new
Geneva facility.

BY NORMA BUCHANAN

Rolex's new facility
at Plan-les-Ouates





Rolex makes its dials at its facility in Chêne-Bourg. Here a crown goes on the dial of an Oyster Perpetual Day-Date

Rolex has always had a Garbo-like sense of privacy. With no very good reason to court the media, or even allow them through its doors, it chugs happily along, selling its roughly three-quarters of a million watches a year, which bring in some 2 billion Swiss francs (this is an estimate; the company, needless to say, does not reveal sales figures.) As the world's biggest luxury watch brand, with a sterling image that never fades, Rolex needs publicity like Garbo needed more fans.

So recently, when Rolex invited us to visit its facilities in Geneva, to actually go inside

them and see real Rolex employees making real Rolex watches, we didn't think twice.

In early April, *WatchTime* and about 50 U.S. retailers gathered for a daylong tour that would take in the company's three Geneva factories. They make all the company's cases, bracelets and dials and assemble its finished watches. (Alas, we will not see Rolex's only other factory, in Bienne, where it makes its movements. Maybe another time, we're told.)

Rolex's Geneva facilities are in the final stages of a massive, eight-year-long construction and renovation project. Its aim is

to bring together the many manufacturing operations, some 19 in all, that were once spread out in and around Geneva. In the late 1990s, when a wave of consolidation swept over the watch industry, Rolex began to buy up many of its suppliers in order to gain greater control of them, creating what the company refers to as "the Rolex Group." As Patrick Heiniger, managing director and CEO, explains in a brochure about the Geneva facilities, "At the start of the 21st century, we made a strategic decision to ensure our autonomy and maintain control over the essential components of

Rolex's building at Plan-les-Ouates is huge, the size of five football fields, jet black and forbidding. "The black glass facades conceal a surprising world," Rolex says.

At Plan-les-Ouates, the average wait for components once they have been ordered from a workstation by means of a click of a mouse is eight minutes.

our watches. We integrated our Swiss suppliers into the Group, and consolidated our Geneva activities at three new sites in buildings that exemplify state-of-the-art technology." These suppliers included the bracelet maker Gay Frères, the case maker Genex, the dial manufacturer Beyeler and the winding-crown producer Boninchi. Having brought all of them under the Rolex banner, the company wanted to bring them under the same roof, or rather, three roofs.

The consolidation is the latest chapter in Rolex's long history in Geneva. The company has been an institution there for nearly a century, almost as much a part of the

city's identity as the famous jet d'eau at the mouth of the Rhône or the lovely waterfront skyline. Rolex founder Hans Wilsdorf moved Rolex to Geneva in 1919 (the company was born in 1905 in London), and it remained in the city center for more than 40 years. In 1965, Rolex completed construction of new headquarters in an industrial section of Geneva called Acacias, southwest of the city center. Its move there broke with Geneva watchmaking tradition, which held that companies be located on the banks of Lake Geneva.

Now, with just a year or so to go until the last glistening green glass panel is hoisted

into position on the refurbished headquarters, Rolex, in an uncharacteristic burst of openness, wants to show off its deluxe new digs.

Life upon the shelves

We start at the spanking new building in Plan-les-Ouates (pronounced "plan lay WHAT"), which was completed last October. This district, on the outskirts of Geneva, has recently become a luxury-watch stronghold. Patek Philippe, Vacheron Constantin, Piaget, and Frédérique Constant have all built new production facilities there, turn-

Rolex's gem-setting and dial-manufacturing facility at Chêne-Bourg



INSIDE ROLEX

ing the flat, featureless expanse into a showcase of eye-catching, ultra-modern industrial architecture. Rolex's building is the most imposing of all; it is huge (it covers nearly 26,000 square meters of space, roughly the size of five football fields), jet-black, and forbidding.

Inside, we see a short movie presenting facts and figures about the new building. It's 11 stories high, we're told, with five of them underground, and composed of three parallel, rectangular units, connected by a central corridor. It has 157,000 square meters of floor space and houses 1,700 machines. Deliveries are made via a 10-meter-wide covered road that runs through the building. The roof is covered with gardens and is used as a relaxation area by the 1,500 people who work in the facility.

The glass that completely covers the building shields the work within from prying eyes. Those lucky enough to penetrate that armor are in for a treat, the film's narrator suggests. "The black glass facades conceal a surprising world," he says.

He's right, as we discover from the very

first stop on the tour. It's the components storage room (the prosaic name doesn't do it justice, as we soon find out), on the second underground floor. To get there, we pass through an ultra-secure entryway equipped with a retina-scanning system, meant to foil thieves with designs on the treasure within.

We stand on a walkway, behind a floor-to-ceiling pane of glass, and look upward and downward at layer upon layer of storage shelves: four stories' worth of them, holding 30,000 separate compartments. (There are an additional 30,000 compartments in a second storage room, a precaution in case disaster strikes the first one.) The vast expanse of shelves is itself impressive, but the real spectacle is the computer-directed conveyors that pick up the components from the bins and deliver them to work stations throughout the building. There are countless of these automated gofers zipping along aluminum rails, stopping, snatching the parts from the compartments, and zipping away again. Four kilometers of these rails snake through the facility; the

system extends to the building's farthest reaches. The average wait for components, once they've been ordered from a workstation by means of a few mouse clicks, is eight minutes.

We gaze for quite a while, transfixed by the speeding conveyors, whose loud, constant whirring makes it difficult to hear anything below a shout. We laugh like kids in a funhouse when once in a while a conveyor comes zooming toward



Attaching a chronometer seal to a gold bracelet. Rolex not only makes its own cases and bracelets at Plan-les-Ouates, it alloys its own gold there.



"At the start of the 21st century, we made a strategic decision to ensure our autonomy and maintain control over the essential components of our watches."

Rolex CEO Patrick Heiniger

us as if to crash through the glass pane, then stops short at its destination a few feet from our faces.

The Rolex production manager leading the tour tells us the system is working above Rolex's initial expectations, and is 98% reliable. Then he herds us away, which, given our fascinated dilly-dallying, is like herding cats.

Gold standards

Where do these components – cases, bracelet links, tiny bracelet fixings, clasps, and myriad other bits – come from? To find out, we take the elevator up to the ground floor. We're on our way to the foundry to see, as the movie describes it, "the first step in the creation of a Rolex." The company mixes its own gold, enabling it to both create its own alloys, like a special blend of pink gold it recently developed (the alloy doesn't lose its pink tint, the way some other pink-gold alloys eventually do, Rolex says), and to control the gold's quality. Rolex is the biggest user of gold in Switzerland and the only watch company that does its own alloying.

We see the end product in a so-called "gold pour," in which half a gallon of fiery molten gold streams from a crucible into a pan. After it cools, the metal is stamped into cases or casebacks or drawn through a series of dies to form gold wire of the right shape to make the various Rolex bracelets: the Oyster, the President, etc. Because Rolex uses so much gold, it's able to employ machines normally used for steel or aluminum, which are larger than standard gold-pro-

cessing machines and hence more precise. It's a good thing: we're told that the tolerance for bracelet-component parts is 2/100 of a millimeter (each bracelet has about 200 parts), and that's why a Rolex bracelet will last 30 to 40 years without needing repair.

Steel parts are made in the same department. Rolex uses an alloy known as 904L (it's the only watch company to do so, it says) that it buys from outside suppliers. The steel resists corrosion extremely well and is also very tough, so that it's durable, but quite difficult to machine.

After the parts are fabricated, they're polished. A robot, enclosed in a glass cubicle, handles the initial polishing. We watch it (him? it's wearing a baby-blue dust cover that cloaks its oddly misshapen body), mesmerized by its jerky but somehow lifelike movements, as it "holds" a watchcase against a polishing machine. It's nightmarish and funny at the same time, like the creatures in the bar scene in "Star Wars." The robot is a high-maintenance employee: we're told it needs to be recalibrated after every 10 cases it polishes to keep it working with the required precision. But it clearly earns its keep: "With a little help from the robots, you can make a very good product," the Rolex manager cheerfully points out, glancing at his electronic colleague.

When the robot is finished, the case is passed along to humans for fine polishing. Only real hands and eyes can detect tiny imperfections that might remain on the case's surface, we're told.

Robo jock

Our next stop is the laboratory, where scientists, engineers and technicians (there are 20-plus PhD's employed there), work on quality control, research and development and general trouble-shooting, like fixing a glitch on the production line or diagnosing the cause of a difficult-to-open bracelet clasp. "You can see there are people at the center of Rolex, not machines," the Rolex

manager tells us. Simple tasks have been reassigned to robots, he explains, but people still do the complicated ones.

These jobs include making sure the raw materials are sufficiently pure before they're made into watch parts. This means examining them with a scanning electron microscope. We're told a story that illustrates how stringent its standards are for raw materials: When Rolex receives bars of steel from its supplier, the company performs dif-

ferent tests on them, including a polishing test. One recent polishing test produced a small scratch, what the technicians call a "comet," on the surface of the bar. Examining the steel under the electron microscope, the Rolex technicians found a minuscule particle, 8 microns across (1/10 as wide as a hair) in front of the comet. They analyzed it and found that the particle was composed partly of titanium. They phoned the steel supplier, who told them that the furnace

When its technicians discovered a microscopic trace of titanium in a shipment of steel, Rolex returned the entire shipment – 10 tons of steel – to the supplier.



Attaching the crown to the 50th anniversary edition of the Rolex GMT-Master II

used to alloy the metal had earlier been used to make titanium steel for another customer. The furnace had not been cleaned thoroughly and some traces of titanium remained in it. Hearing this, Rolex rejected the entire load, sending back 10 metric tons of steel.

A few minutes later, in the research and development section of the lab, we learn a new word (new to most of us, that is): tribology, the science of wear and tear. We see another robot, this one dedicated to studying the effects of

Behind the bling

We wave good-bye to the robot, which is still frantically gesticulating, and soon pile into a bus headed for the Rolex factory in Chêne-Bourg, a few miles to the east. There, human hands, steady, patient ones, prevail. The first building to be completed in the Rolex remodeling program, in 2000, this facility was once the Genex case factory and is now used for setting gems and making dials.

In the research and development section of the lab, we learn a new word: tribology, the science of wear and tear.

wear on watch bracelets. The robot has a mannequin-like wrist and hand and wears a Rolex watch. It is performing a sequence of fancy moves with its humanoid hand: twisting it, thrusting it down, turning it sideways, lifting it up, then repeating the series again and again. The moves, odd as they seem, are modeled on real life. "We put some sensors on a colleague of mine while he was doing different kinds of sports: running, tennis, golf, and everything else," a research and development manager tells us. "We examined the motions and tried to [duplicate] them with this robot." The robot allows Rolex to simulate a year's worth of wear in just one week, and hence discover in a jiffy the advantages of one bracelet design over another.

First we see the gem-setting process. In one room, little diamonds are arranged in neat piles, waiting to be placed on bezels, dials and bracelets. Here, their color is checked to make sure it's the requisite "river" grade (the equivalent of D or E on the Gemological Institute of America's grading scale, which is widely used in the United States). The diamonds, in round, trapeze, or baguette shapes, are painstakingly set by hand with the aid of a microscope.

In the dial-making department, we see more handwork: printing of the dials and the addition of markers and numerals. Dials are made of brass, gold or platinum. Color is imparted to the dials by a variety of meth-



Voilà: The finished product

ods: galvanization, physical vapor deposition, or painting. Mother-of-pearl and meteorite dials are made by gluing a thin layer of the decorative material onto a brass substrate.

Putting it together

Another bus ride takes us into Geneva's city limits to the area called Acacias. We come to our third and final stop, the climax of the tour, in some sense: Rolex worldwide headquarters. This complex, in the final stages of expansion and renovation (it's scheduled to be finished this year), is where the top Rolex executives, including Patrick Heiniger, have their offices. Rolex-watchers have long regarded the building, covered in glass tinted in imperial Rolex green, as a fortress only a little less impenetrable than the Pentagon.

The facility consists of two side-by-side towers housing offices and administrative departments and, next to them, four industrial buildings. It is in these buildings that Rolex watches are assembled, put through their last quality-control tests, packaged and shipped to markets throughout the world.

Most of the assembly is done by hand at rows of immaculately clean workbenches where employees, most of them women, combine all the pieces made elsewhere (movements from Bienne, cases and bracelets from Plan-les-Ouates, dials from Chêne-Bourg) into the final product. We watch the women, agile-fingered and as steady of touch as micro-surgeons, lifting up tiny gold watch hands (all Rolex watches have gold hands) with an air pump, so they won't get scratched, and positioning them on the dial. At other workstations, employees are casing the movements and, at still others, placing the winding crowns. One of the final steps is attaching the winding rotor, a task performed with an electric screwdriver programmed to tighten the screws to precisely the right tension.

Throughout it all, the women constantly check and re-check their work. Does the date jump at midnight, as it should? Are the



Rolex's Acacias headquarters in the 1980s

ROLEX IN GENEVA: A TIMELINE

- 1919:** Rolex founder Hans Wilsdorf relocates the company from London to Geneva, at a site in the city center near the Cathédrale Saint-Pierre.
- 1960:** Needing more space, Rolex decides to build a new headquarters in the Acacias industrial area in Geneva, to the southwest of the city center.
- 1965:** Rolex inaugurates the Acacias headquarters, which consists of two eight-story towers.
- 1978 to 1995:** Two additional buildings are added at the Acacias site.
- Late 1990s:** Rolex begins a program of vertical integration, buying up such suppliers as the bracelet maker Gay Frères and case maker Genex.
- 1998:** Construction begins on the Chêne-Bourg site, where Rolex does its gem setting and dial making. With its glistening black-glass façade, the building will serve as a model for Rolex's other Geneva factories.
- 2000:** The Chêne-Bourg facility is completed.
- 2001:** Construction begins on Rolex's bracelet and case manufacturing plant in Plan-les-Ouates.
- 2002:** The company begins the refurbishing of the Acacias headquarters, which includes heightening the two towers by three stories, covering them with green glass facades, and building two additional manufacturing buildings.
- 2005:** The Plan-les-Ouates facility is completed.
- Fall 2006 (projected):** The Acacias refurbishing is completed.

hands precisely superimposed? Is the dial flawless? Does the rotor sound as it should when it turns, or might one screw be a tad too loose? If everything passes muster, the serial numbers of the case and movement, which are engraved by laser, are registered, and the case is closed up.

The watch is still not ready to meet the world. First it must pass a few more tests. Now machines take over. First there's a water-resistance test using air pressure (the riskier water-resistance test, using water, comes later). Then the watch will be wound

automatically, by means of its rotor, to make sure the winding mechanism produces enough energy to keep the movement running. The precision tests come next. They're similar to those performed by COSC. (The movements have already been certified by that agency; the purpose of these in-house tests is to make sure the movements still measure up after casing). The dial is photographed once, then again, 24 hours later, and the timing compared to that of a reference clock regulated by an atomic clock. Then the watch's

precision is measured in each of four different positions. Lastly, the watch is placed in a water tank and tested at a pressure level 10% above what is guaranteed for that particular model. The bracelets are attached, and the watches' guarantees are placed with their respective watches. The watches are boxed for shipping, and off they go.

And so do we. After a dinner atop one of the towers, hosted by Patrick Heiniger, we leave the headquarters, a bounce in our step. Why? Because we've done it, we've gotten inside Rolex. ■

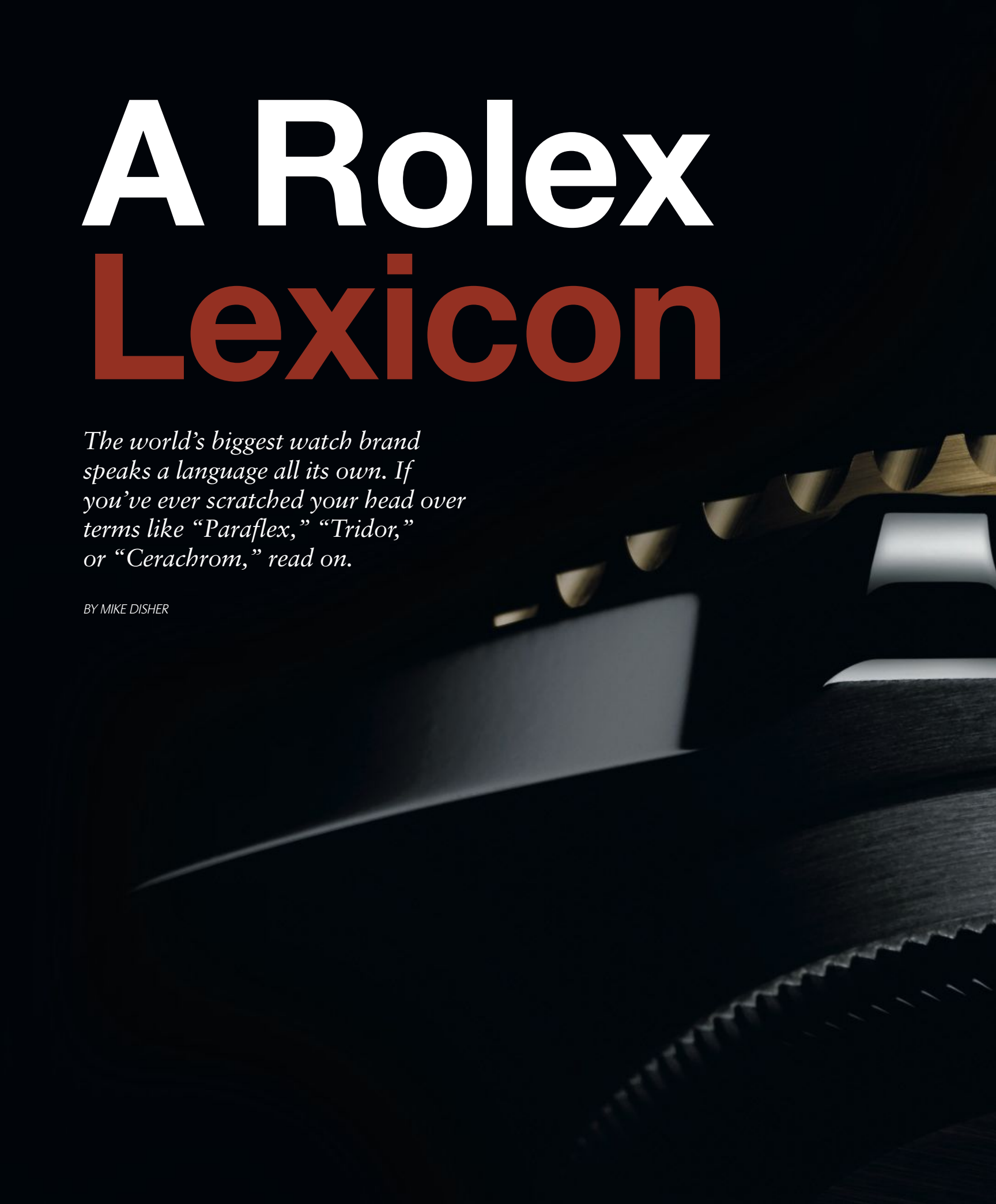


Attaching a rotor at the Acacias workshops

A Rolex Lexicon

The world's biggest watch brand speaks a language all its own. If you've ever scratched your head over terms like "Paraflex," "Tridor," or "Cerachrom," read on.

BY MIKE DISHER





*The Triplock crown
system protects Rolex
divers' watches.*

904L STAINLESS STEEL:

A relatively high-cost, low-carbon stainless-steel alloy containing nickel, molybdenum and copper. It is highly resistant to corrosion and often used in the aerospace and chemical industries. Its high chrome content and purity ensure high polishing quality.

CERACHROM:

A bezel insert or monobloc bezel developed and patented by Rolex and made of extremely hard, corrosion-resistant ceramic whose color is unaffected by the sun's ultraviolet rays. The graduations are coated with a thin layer of gold or platinum via physical vapor deposition (PVD).

CHROMALIGHT:

A luminous substance that emits a blue glow and that is applied to the hands and hour markers of some Rolex Professional models in the Oyster collection. Rolex claims that Chromalight's luminosity lasts more than eight hours, which is almost twice as long as standard luminescent material, and that the intensity of the luminosity is more consistent over time. Chromalight was introduced in 2008 on the Rolex Deepsea, and then on Submariner Date models (2008–2010). Chromalight is also used on the Oyster Perpetual Explorer, Explorer II, Submariner, Yacht-Master, and Yacht-Master II in Everose Rolesor.

CROWNCLASP:

Concealed folding clasp designed and patented by Rolex. In the latest version, the opening and closing mechanism is concealed from view beneath a small Rolex-crown-shaped lever. The Crownclasp is currently fitted on classic Datejust and Day-Date models with President, Jubilee, Oyster, and Pearlmaster bracelets.

CYCLOPS:

A lens on the crystal above the date window that magnifies the date display by two and one-half times, making it easier to read. The Cyclops was introduced on a Datejust model in 1953. At that time, the lens and the crystal were a single piece, made of Plexiglas. Beginning in the 1970s, Rolex equipped its watches with synthetic sapphire crystals, to which the Cyclops lens is affixed with clear adhesive.

EASYLINK:

A rapid extension link system that allows the wearer to easily extend the watch bracelet by 5 mm for greater comfort. Easylink is currently available only on Oyster bracelets fitted with Oysterclasp or Oysterlock clasps. The system was developed and patented by Rolex.



The new Explorer is made of 904L stainless steel.



The Rolex Deepsea glows with blue Chromalight.

EVEROSE:

18k rose gold developed, patented and produced by Rolex in its own factory. The alloy owes its unusual color to the addition of 2 percent of platinum. The platinum content also helps preserve the alloy's pink color over time.

FLIPLock:

An extension link system on Oyster bracelets fitted on the Submariner and Rolex Deepsea divers' watches. It allows the bracelet to be lengthened for wear over a diving suit.

GLIDELock:

An extension system with a rack integrated into the clasp, developed and patented by Rolex. It enables fine adjustment of the bracelet length in 1.8-mm increments for a total extension of 18 mm. It is used on the Submariner Date and Rolex Deepsea divers' watches. The former has a fixed rack under the clasp cover, and the latter features a lift-up version that enables the wearer to adjust the bracelet without taking off the watch.

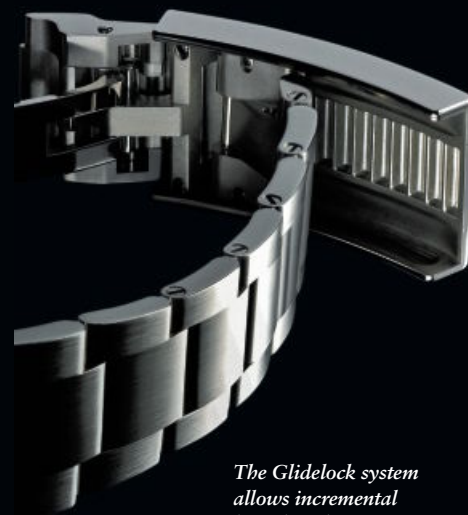
GOLD CRYSTALS:

Material obtained by a process of gold crystallization for use in dials. The dials can be yellow, gray or pink or decorated with motifs via electro deposition or PVD. The gold crystallization process was developed by Rolex and is carried out in its own foundry.

Rolex developed Gold Crystals dials and makes them in house.



The Fliplock buckle allows the bracelet to be extended.



The Glidelock system allows incremental bracelet adjustment.

The new Sky-Dweller 18k Everose case is produced in house.

GOLDUST DREAM:

A type of mother-of-pearl dial to which an openwork decorative motif is applied as a thin layer of gold via a PVD process patented by Rolex.

JUBILEE BRACELET:

A five-piece-link metal bracelet featuring three inner thin, polished links and two outer brushed or satin-finished links. The Jubilee bracelet was designed for the launch of the Oyster Perpetual Datejust in 1945. Today, this bracelet is always fitted with a Crownclasp concealed clasp.

MICROSTELLA:

A system using screws and gold nuts to modify a balance wheel's moment of inertia. One or two symmetrical pairs of tiny, star-shaped nuts are screwed to the edge of the balance wheel rim. Slightly tightening or loosening the nuts (using a matching Microstella wrench and always adjusting opposing pairs simultaneously to preserve the poise) corrects the rate.

OYSTER BRACELET:

A sporty bracelet introduced in the late 1930s and made of broad, flat, three-piece links. This is the most widely used bracelet in the Oyster collection and is fitted to models including the Submariner, Explorer, Yacht-Master, and Cosmograph Daytona. The Oyster bracelet can also be fitted to classic models such as the Datejust, Day-Date, and Sky-Dweller. The Oyster bracelet can be equipped with all types of Rolex clasps, including the Oysterclasp, Oysterlock, and Crownclasp, and it can accommodate the Easylink comfort extension system.

OYSTER CASE:

Invented by Rolex in 1926, this was the world's first water-resistant case for a wristwatch thanks to its patented system of screw-down bezel, caseback and winding crown. In 1927, a young Englishwoman, Mercedes Gleitze, famously swam across the English Channel wearing a Rolex watch equipped with the Oyster case. The feat proved a marketing boon to Rolex. Today, using hermetic construction (solid middle case, screw-down caseback and crown, friction-fitted crystal and bezel), all Rolex Oyster watches are guaranteed water-resistant to a depth of at least 100 meters (330 feet); 300 meters (1,000 feet) for the Submariner divers' models; or 3,900 meters (12,800 feet) for the Rolex Deepsea.



The Goldust Dream dial is patented by Rolex.



The Oyster bracelet is synonymous with Rolex sports watches.

The Microstella adjustable-inertia system

OYSTERCLASP:

A folding clasp with a cover, fitted on Oyster bracelets and leather straps. The latest generation of Oysterclasps open and close using a lever to improve security and ease of opening.

OYSTERLOCK:

A folding clasp with a cover and a safety catch to prevent accidental opening. The latest generation features a mechanism with 15 components. A snap-fit lever increases the finger force of the wearer for easier operation. The Oysterlock clasp is used on Oyster bracelets fitted on many of the watches in the Professional series.

PARACHROM:

A material developed, patented and manufactured by Rolex for use in hairsprings. It is made of a niobium, zirconium and oxygen alloy. Rolex claims a Parachrom hairspring is up to 10 times less susceptible to shocks, offers great stability to temperature variations, and is entirely unaffected by magnetic fields. The Parachrom hairspring was introduced in the Cosmograph Daytona in 2000. In 2005, a blue-colored version with improved performance (Parachrom Blu) was introduced for the new GMT Master II and the Cosmograph Daytona. The blue color is obtained by modifying the spring's surface structure: The layer of oxygen present on the surface is thickened to about 50-100 nanometers to increase its long-term stability. The Parachrom name comes from the fact that the alloy is paramagnetic and that it is colored (*chrom* in Greek). Research leading to the Parachrom spring resulted in the filing of two patent applications, one for the chemical composition of the alloy and the other for the process used to modify the spring's surface to stabilize its properties (resulting in the blue coloring).

PARAFLEX:

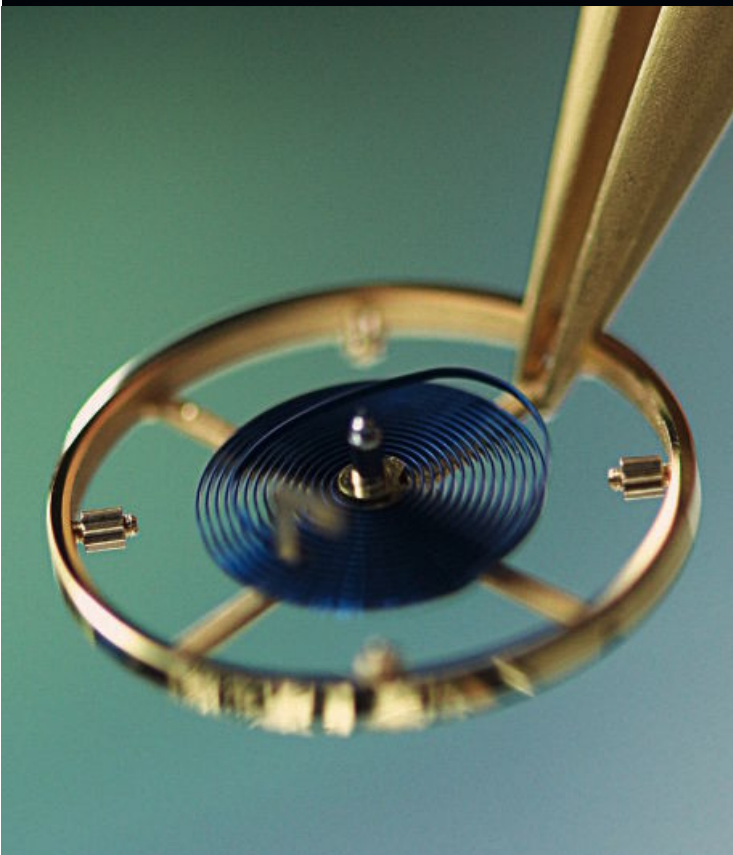
A term describing a type of shock absorber developed and patented by Rolex. The company claims that Paraflex shock absorbers increase the shock resistance of sensitive movement components, notably the balance staff, by up to 50 percent.

PEARLMASTER BRACELET:

A metal bracelet with five-piece rounded links created in 1992 for the launch of the Lady Datejust Pearlmaster model. This bracelet is also available on special editions of the Day-Date and Datejust models. This bracelet is always fitted with a Crown-clasp concealed clasp.

PERPETUAL:

A self-winding system with a free rotor invented by Rolex in 1931 that allows the mainspring to be wound using the natural movements of the wrist. The Perpetual rotor is designed to provide a constant and optimal source of energy for the watch movement.



Rolex manufactures its Parachrom hairsprings in house.



The Paraflex shock absorber helps protect the balance staff.

PRESIDENT BRACELET:

A metal bracelet with rounded three-piece links created in 1956 for the launch of the Oyster Perpetual Day-Date, the first wristwatch to display the date and day of the week spelled out in full on the dial. Today the President bracelet is reserved for the Day-Date and for certain versions of the Datejust in precious metals. The President bracelet is always fitted with a Crownclasp concealed clasp.

RINGLOCK SYSTEM:

Case architecture that enables the Rolex Deepsea divers' watch to resist the pressure found at a depth of 3,900 meters (12,800 feet). The system is composed of three elements: a domed 5-mm-thick sapphire crystal, a nitrogen-alloyed stainless-steel compression ring positioned inside the middle case, and a grade 5 titanium caseback held against the middle case by a screw-down steel ring. The system was designed and patented by Rolex.

RING COMMAND:

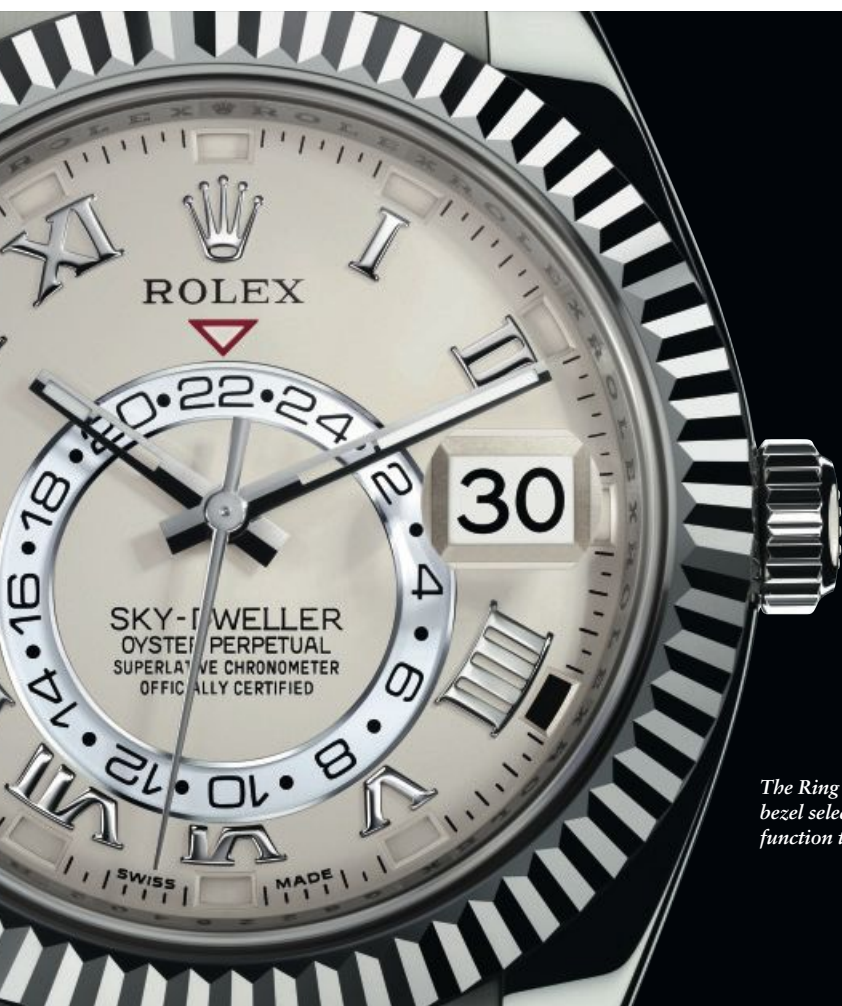
A rotatable bezel that interacts with the watch movement. On the Yacht-Master II, it affords access to the programming function of this regatta chronograph's mechanical countdown. On the Sky-Dweller model, the system is used to select the function to be set: date, local time, or reference time. Once selected, the function can be rapidly adjusted, forward or back, with the crown. The Sky-Dweller system consists of 60 components. The Ring Command system was developed and patented by Rolex.

ROLESIUM:

A combination of stainless-steel and platinum components on the same watch. The Yacht-Master is the only Oyster model available in Rolesium. Its bezel is made of platinum while the case and bracelet are made of 904L stainless steel.

ROLESOR:

A combination of 18k-gold and 904L stainless-steel components on the same watch.



The Yacht-Master is the only model available in Rolesium.



The Ring Command bezel selects the function to be set.

The President bracelet is a Rolex standard.

SAROS:

The name given to the Sky-Dweller's annual calendar mechanism. Saros is a Greek term that refers to an astronomical cycle of alignment between the sun, the Earth, and the moon. The Sky-Dweller's calendar system is designed around a fixed planetary gear wheel at the center of the movement. A satellite wheel engages with the planetary wheel and rotates, orbiting the planetary wheel in one month, driven by the date disk. The satellite wheel is fitted with four fingers for the four 30-day months. These fingers force the date to jump two days at the end of the month. After one year, the system realigns to its original position, having completed one Saros cycle. The system, designed by Rolex, adds only two gear ratios and four gear wheels to the Rolex instantaneous date calendar.

TRIDOR:

A combination of 18k yellow, white and Everose gold used for bracelet links

TRIPLOCK:

A screw-down winding crown with a triple water-resistance system (see opening photo) developed and patented by Rolex for its divers' watches, now fitted on several models in the Professional series. Identified by three dots below the Rolex emblem on the crown, it guarantees water resistance to a depth of 100 meters (330 feet), 300 meters (1,000 feet) or, for the Rolex Deepsea, 3,900 meters (12,800 feet).

TWINLOCK:

A screw-down winding crown with a double water-resistance system guaranteeing water-resistance to a depth of 100 meters (330 feet). The system is identified by two dots (gold models), one dot (platinum models) or a line (steel models) below the Rolex emblem on the crown. It was developed and patented by Rolex.

The Twinlock crown system protects to 100 meters.

